

BEST PRACTICE PAPER: NEW ADVICE FROM CCo8

# LOWERING THE PRICE OF SCHOOLING

Peter F. Orazem, Paul Glewwe & Harry Patrinos





COPENHAGEN CONSENSUS CENTER  
BEST PRACTICE PAPER: NEW ADVICE FROM CCO8

## Best Practice Paper

# The Benefits and Costs of Lowering Parental Schooling Costs to Improve Educational Outcomes

Peter F. Orazem<sup>\*</sup>, Paul Glewwe<sup>+</sup> and Harry Patrinos<sup>#</sup>

Opinions expressed are our own and not necessarily those of the World Bank. This report contains summaries of our longer paper, "The Benefits and Costs of Alternative Strategies to Improve Educational Outcomes," a forthcoming chapter in an edited volume to be published by Cambridge University Press.  
Cover image credit: Andrew Hall, Westminster University

<sup>\*</sup>Department of Economics, Iowa State University, Ames, IA 50011-1070, pfo@iastate.edu

<sup>+</sup>Department of Applied Economics, University of Minnesota

<sup>#</sup>The World Bank

---

COPENHAGEN CONSENSUS CENTER

COPENHAGEN BUSINESS SCHOOL • SOLBJERG PLADS 3 • 2000 FREDERIKSBERG • DENMARK  
+45 3815 2255 • INFO.CCC@CBS.DK • WWW.COPENHAGENCONSENSUS.COM



## PREFACE

For two years before Copenhagen Consensus 2008, a team of experts wrote papers identifying the best ways to solve the world's biggest problems.

Those papers showed that we have the knowledge to do tremendous amounts of good in each of these areas.

That research was utilized by a panel of top economists, including Nobel laureates, who were commissioned by the Copenhagen Consensus Center to identify the most effective investments.

The prioritized list produced by Copenhagen Consensus 2008 provides governments, donors and philanthropists with a guide to the areas where relatively small amounts of money can prove extremely powerful.

The research that provided the building blocks to this process – and a full description of the outcome – form the book, 'Global Issues, Global Solutions, Volume Two', published by Cambridge University Press in 2009. This is an excellent overview of global problems and the most promising solutions.

Given the level of interest in Copenhagen Consensus 2008, the Copenhagen Consensus Center decided to commission a specific set of papers that deal with the spending options given highest priority by the expert panel.

The goal of these Best Practice Papers is to provide clear and focused empirical recommendations on the costs and benefits of implementing the solutions, and advice on how to do so.

The problems dealt with by Copenhagen Consensus 2008 are vast. The practical approaches identified here prove incredibly powerful reading. The Copenhagen Consensus Center hopes that they shall prove an invaluable resource, and further advance the goal of promoting the most sound investments to help humanity.

Bjorn Lomborg  
Copenhagen, 2009

## EXECUTIVE SUMMARY

In almost all countries of the world, schooling raises earnings. This is true in developing as well as developed countries. Similar returns to schooling are found for both urban and rural residents and for both women and men. The median increase in earnings varies from 8-10% per added year of schooling. The returns are so commonly found and are sufficiently large to justify the Millennium Development Goal that every child should be given at least a primary education, the schooling level that nearly guarantees lifetime attainment of literacy in every country.

Although steady progress has been made over the past 50 years toward increasing literacy worldwide, we are still considerable distance from Universal Primary Education (UPE). Of about 112 million children born annually in developing countries, 23% or about 26 million will not complete primary school. Of these 11.6 million will never start school, and getting them to complete the primary cycle will be costly. However, 14.4 million or 55% of those failing to complete five years of schooling will start school but drop out before completing the grade five. It is these 14.4 million children that can be reached in the most cost effective manner, both because their parents cared enough about schooling to send them and because there was a school in the area that they could attend.

Focusing on the children who start primary school but drop out will also raise education levels for underserved groups. In developing countries, girls, rural children, and children in the poorest households are the least likely to complete primary school. We estimate that a strategy focused on primary school dropouts will reach 49% of the girls, 55% of the rural children and 54% of the children in the poorest two income quintiles that currently are not completing grade 5.

There is substantial evidence that developing country parents, when faced with borrowing constraints, will underinvest in their children's schooling relative to the social optimum. One solution is to lower the cost of schooling to parents. Although only 18% of developing countries officially charge tuition, 84% charge some type of formal or informal fee for their children to attend primary school. These fees include charges for uniforms or school supplies, mandatory payments to parent-teacher associations, as well as formal or informal tuition and other miscellaneous fees. Studies from all parts of the developing world have shown that parental schooling choices can be very sensitive to reductions in these fees.

The survey examines the outcomes of four different mechanisms to lower the costs parents face when sending their children to school. The first involves the elimination of primary school tuition. Evidence from several countries demonstrates that these fee reductions can result in substantial increases in school enrollments. The case of Uganda is the most carefully researched. Enrollments increased 60% following the elimination of school fees. Even though the children who entered school after the fee reduction were more likely to drop out before completing the primary cycle, they finished in sufficient numbers to justify the expense.

The second strategy involves the use of capitation grants that promise private school operators a fee for providing schooling for girls in poor neighborhoods of Pakistan. The program resulted in large increases in schooling in urban areas but more modest gains in rural areas. Nevertheless, because the subsidy is much lower than the cost of building and operating a public school, the strategy can generate benefits that outweigh costs.

In Colombia, there was evidence that children were leaving school after completing the primary cycle because of insufficient capacity in the public secondary schools. The government offered to provide vouchers that would allow poor children to attend private secondary schools that had excess capacity. The program generated considerable interest, so much so that vouchers had to be allocated by lottery because demand outstripped the number of vouchers available. Evaluations of the program found that voucher recipients completed school in greater proportions and scored higher on standardized tests. The implied earnings gains from the induced increase in schooling and cognitive attainment outweighs the costs of the program.

The final program provided tutors for poor children in India. Tutors are commonly used to supplement schooling in Asian countries, but poor households cannot afford them. In many countries, there is a ready supply of educated young women who represent a potential supply of tutors that can be hired at modest cost. The benefits in improved cognitive attainment can be substantial.

Mechanisms that lower the cost of schooling for parents can be targeted in ways that maximize benefits relative to costs. Programs such as vouchers or capitation grants can be paid only when the desired increase in schooling occurs and can be targeted to the poor or other underserved populations. Tuition reductions can be targeted to the ages at which dropouts are commonly occurring and can be targeted to the poor or to rural areas that are most responsive to schooling price. Such targeted price reductions have the greatest chance to raise schooling at modest cost.

# INTRODUCTION

One of the least controversial of the Millennium Development Goals is that of attaining Universal Primary Education (UPE) by 2015. The economic benefits from education are generally accepted, in part due to empirical support from literally hundreds of studies that have consistently found positive private returns per year of schooling in developing countries. Estimates based on 63 household data sets from 42 developing countries give a good sense of the range of returns to schooling for males and females and for urban and rural residents.<sup>1</sup> The interquartile range for estimated real returns across countries varies from 5 to 10 percent for men and from 9 to 12 percent for women. The interquartile range for both urban and rural residents lies between 5-11%. The median return ranges from 8-10% per year of schooling, depending on the demographic group, which is slightly lower than the average return of 10.9% reported for low income countries by Psacharopoulos and Patrinos (2004) in their review of studies published in the 1990s.

Countries vary in their private returns to schooling, although the returns are almost uniformly positive. The highest returns tend to be found in countries that allow their labor and product markets to function relatively freely. Prominent evidence supporting the role of free markets in fostering returns to education is the sharp increase in returns to schooling experienced in almost all formerly planned economies after switching to more market oriented systems. There is far less variation in returns within countries. Countries with high returns for men tend to have high returns for women as well, and countries that have high returns in urban markets also have high returns in rural markets.

While there is broad agreement that education pays, at least on average, there is less agreement on how to make additional progress toward UPE. This paper reviews evidence in support of lowering the costs parents face in sending their children to school. We argue that parents' decisions on whether and how long to send their children to school are quite sensitive to the price parents must pay. These costs can be a large fraction of household income, particularly for the poor, even in countries that mandate free tuition at public schools. Fees charged for school materials or parent-teacher associations, formal or informal, are shown to have a large impact on school enrollments.

We begin our review by presenting evidence that increasing the fraction of children who complete primary schooling is a reasonable target, and that the least cost population to target in increasing primary graduation rates are the students who start school but fail to complete the primary cycle. We also argue that we are unlikely to make additional progress toward UPE without government intervention that aims to resolve household resource constraints. We then show that school fees are charged in most developing countries, that these fees affect the fraction of children starting and completing primary school, and that parental choices have been very sensitive to even partial reduction in these fees. We then review four different strategies that have been employed to lower school costs: a universal reduction in public school fees;<sup>2</sup> a program to subsidize private school entry through capitation grants; a voucher program

---

<sup>1</sup> We are indebted to Claudio Montenegro for sharing his regressions results with us.

<sup>2</sup> A variation of reduction in public school fees is the conditional cash transfer, a payment to parents if their children regularly attend school. This can be thought of as a "negative fees". For a discussion of conditional cash transfer programs, see Orazem, Glewwe and Patrinos (2008).



to allow poor children to attend private schools; and a program to allow poor children to use tutors. All four are shown to have been cost-effective.

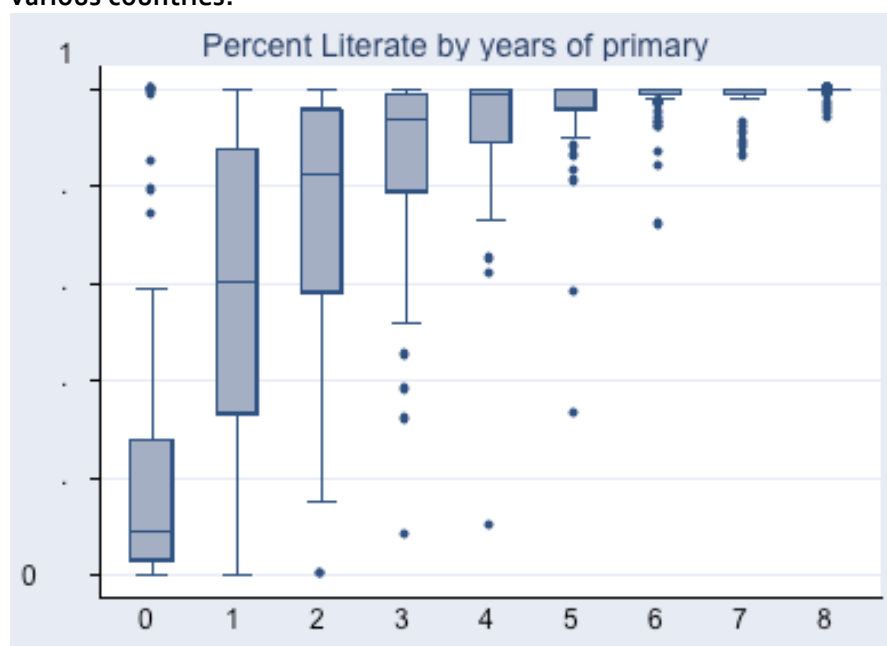
## 1 THE CHALLENGE: INADEQUATE SCHOOL ATTAINMENT

### *Literacy and schooling*

Our task is to evaluate the use of increased schooling as a means of fostering economic development. To do so, we need to establish a link between time in school and the formation of marketable skills. Investments of time and money in a child's schooling that fail to produce basic cognitive skills such as literacy are almost surely a waste of scarce public and private resources. Indeed, studies that include both years of schooling and measures of cognitive skills as factors in explaining earnings find that it is the cognitive skills that raise wages and not time in school (Glewwe, 2002). At the macroeconomic level, Hanushek and Kimko (2000) and Hanushek and Woessmann (2008) report that it is national average cognitive attainment, and not average years of schooling, that drives economic growth.

No country has developed a means of developing cognitive skills outside school. Consequently, while time in school does not guarantee the acquisition of cognitive skills, it is almost impossible to acquire those skills without formal schooling. As shown in Figure 1, a small fraction of youth aged 15-24 report having attained literacy despite never having attended school. At the other end of the spectrum, a few report not having attained literacy despite having been in school 8 years. However, the probability of attaining self-reported literacy rises with years of schooling. Children who complete the primary cycle of five or six years of schooling are almost certain to attain literacy in most countries. This presumption that schooling is needed for literacy underlies the Millennium Development Goal of attaining Universal Primary Education (UPE) by 2015, and it justifies our focus on five years as a target education level for policy purposes.

**Figure 1: Distribution of self-reported literacy by grade attainment for youth aged 15-24, various countries.**



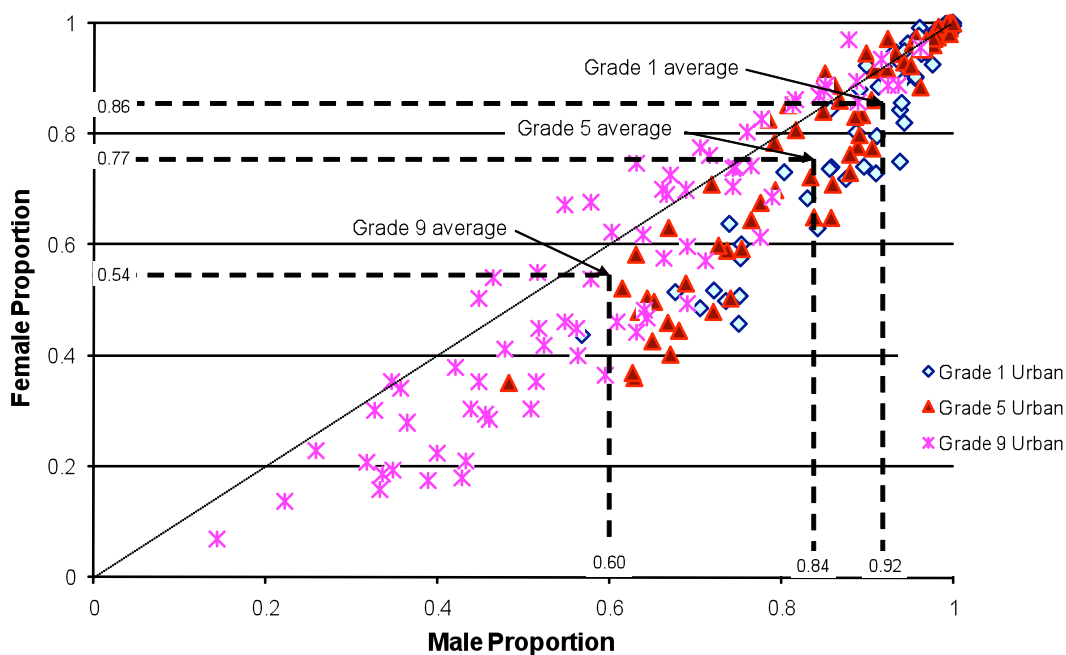
Source: Author's compilation of summary data from 73 household surveys spanning 57 developing countries provided by Claudio Montenegro of the World Bank.

**Who are in the underserved populations?**

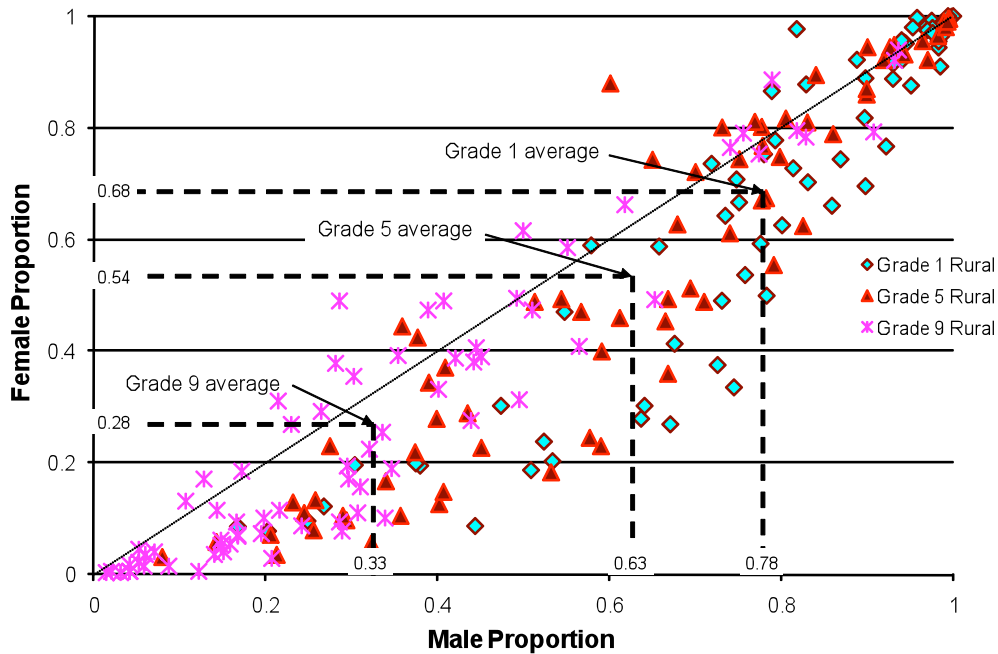
In developed countries, average levels of schooling are nearly equal for men and women, and for those born in urban areas and in rural areas. In developing countries, however, substantial differences in schooling levels are commonly found between these groups. These differences have persisted even though within these same countries, estimated returns to schooling do not differ greatly between men and women or between urban and rural residents. These gaps in schooling attainment are particularly pronounced between those at the top and the bottom of the income distribution within developing countries. Policies aimed at increasing the schooling levels of children in developing countries can be justified if these gaps reflect parental underinvestment in the schooling of their children relative to the social optimum.

To illustrate the magnitude of the problem, we make use of 72 household data sets on schooling attainment compiled by Deon Filmer of the World Bank. All data sets were collected between 1997 and 2006. We computed the fraction of 20-29 year olds who completed grades 1, 5 and 9 in order to show how rapidly educational attainment drops off in these developing countries. The grade 5 information is of particular interest in that completion of five years of schooling represents near assurance of lifetime literacy and numeracy. Separate estimates were generated for males and females and for urban and rural residents.

**Figure 2A: Proportion of Male and Female Urban Population Completing Grades 1, 5 and 9 in 72 Developing Countries**



**Figure 2B: Proportion of Male and Female Rural Population Completing Grades 1, 5 and 9 in 72 Developing Countries**



Figures 2A-B present one way to illustrate the distribution of schooling attainment across the 72 countries. Each point represents paired male and female proportions of the 20-29 year old population that completed a given grade level in a country. Figure 2A shows the relationship for urban areas and Figure 2B for rural areas. The dotted 45° line indicates combinations where males and females are equally likely to attain the grade level. Values on the axes range from 0 to 1 with 1 representing universal attainment. Larger deviations from the upper right-hand point (1,1) mean a greater gap from universal attainment of a given grade level. The average proportion of men and women completing each grade level is indicated by dashed lines with the proportions reported in the chart.

Figures 2A-B summarize the stylized facts regarding schooling attainment in developing countries for men and women in rural and urban areas. First, as the level of schooling increases, the dots are closer to the origin. Of course, the fraction completing grade 9 or more must be smaller than the fraction completing at least grade 5 which will, in turn, be smaller than the fraction completing grade 1. However, it is clear that in urban areas, almost all of the points near the origin are at the grade 9 level – 84% of men and 77% of women complete grade 5. In rural areas, many more grade 5 and even some grade 1 combinations are near the origin. Reflecting the lower grade attainment of the rural born, 63% of rural men and only 54% of rural women complete grade 5. Using our rule of thumb for literacy, therefore, many of the rural-born who start school do not complete enough grades of schooling to attain permanent literacy. Aggregating across the 72 developing countries using population weights, 13% of urban residents and 28% of rural residents age 20 to 29 fail to complete 5 years of schooling. For those in urban and rural areas who start school but fail to attain literacy, the schooling investment is largely wasted.

The second lesson from both Figures 2A and 2B is that in both urban and rural markets, most combinations lie below the 45° line. That indicates that on average, males are more likely to

reach each grade level than females. Women are farther away from UPE than men. The population-weighted aggregates are that 20% of men and 26% of women fail to complete 5 years of schooling. Interestingly, when the combinations lie above the 45° line, it tends to be the 9<sup>th</sup> grade combinations that favor women. Particularly in Latin America, it is the boys that tend to drop out earlier while girls are more likely to complete primary schooling. Nevertheless, in the poorest countries, girls receive less schooling than boys.

A third lesson that is apparent in comparing the pattern of outcomes in Figures 2A and 2B is that the rural combinations are more variable than those in urban areas. Rural combinations are both more likely to fall above the 45° line but also lie farther below the 45° line than are the urban combinations which cluster more closely to the 45° line. As a result, even though the average gap between men and women's school attainment is about the same between urban and rural areas, the largest gaps both favoring and hindering women are found in rural areas.

The fourth and final lesson is that, within countries, there is a very high correlation in school attainment across demographic groups. Countries with high boys' enrollment rates also tend to have high girls' enrollment rates. Countries with high urban education rates have high rural rates as well. Within urban or rural regions, the simple correlation between men's and women's school attainment is about 0.94. Across rural and urban areas, simple correlations between men's educational attainment and between women's educational attainment are about 0.92.

These high within-country correlations in educational attainment represent a major challenge to attaining Universal Primary Education (UPE). The greatest departures from UPE will be country-wide departures and not isolated regional problems within countries that have otherwise attained UPE. That suggests that country-wide policies will be needed to make substantial progress toward eliminating illiteracy, and country-wide policies are expensive. In fact, various estimates of the cost of attaining UPE generated by UNESCO, UNICEF, and the World Bank range as high as \$34 billion, and even these are likely to underestimate the costs.<sup>3</sup> Nevertheless, substantial progress can be made toward UPE by targeting scarce resources to the underserved populations whose needs can be met most inexpensively.

### ***Identifying the populations that should be targeted first***

In Table 1, we present the stylized facts regarding the population of youth aged 15-19 that failed to complete grade 5 by region of the world. Youth in this age range who have not completed grade 5 are very unlikely to complete it later in life. We decompose the population in this age range that fails to complete grade 5 into two groups, those who never went to school and those who dropped out before completing grade 5. Our estimate of those who never went to school is given by the fraction of 14-year-olds who never attended. We present the data by population-weighted averages of geographic regions.

Our presumption is that of all those who fail to attain literacy, the most cost-effective populations to reach are those who began school but dropped out before completing the primary cycle. We know that for children who at least started school, there had to have existed some school capacity of sufficient quality to have induced enrollment. Additionally, these children have parents who cared enough about their schooling to have sent them to school. It is much more expensive to induce parents who have not previously sent their children to school to both enroll their children for the first time and then take them through the primary cycle.

---

<sup>3</sup> Glewwe and Zhao (2006) present a summary of these estimates and a critique of the methodologies employed.

We focus on completing at least five grades of school, a strategy derived from our Figure 1 that showed five grades are almost always sufficient to attain permanent literacy. Investments that do not successfully carry the child through grade five are much more likely to be wasted. The fraction of children not completing grade five varies from very small proportions in China and in Eastern Europe and Central Asia to over 40% of children in Africa. Excluding China and the Eastern Europe and Central Asian countries, 30% of children in developing countries fail to complete the fifth grade. Of these, 55% start school but drop out.

The other statistics in Table 1 demonstrate that for almost all demographic groups, substantial progress toward UPE can be made by reducing dropouts. Aggregating across countries, 61% of males and 49% of females who failed to complete grade 5 did so because they dropped out after starting school. The corresponding ratios for urban and rural residents are 62% and 55%, respectively.

The bottom of Table 1 includes the school entry, completion and dropout rates for children living in households in the poorest two income quintiles. The poorest children are the least likely to attain literacy. Of children in the lowest two income quintiles, 37% fail to complete grade 5 compared to 23% overall. Children in the poorest households fail to complete grade 5 in higher proportions in every part of the world. Yet even among these poorest children who fail to complete grade 5, 54% dropped out after starting school, a proportion comparable to the dropout rates overall. Consequently, for all groups of children failing to complete the primary cycle, reducing the incentives to drop out would generate substantial progress toward UPE for all demographic groups in all regions of the developing world.

### ***Why public intervention in schooling is necessary***

If all of the return from schooling went to the individual receiving the schooling, then the rationale for public investments in schooling would be limited. Consequently, public investments in education have been rationalized by various externalized benefits from schooling.<sup>4</sup> However, the most plausible rationale for public investments in primary schooling decisions is that parents fail to invest optimally in their children's education. While it may be that parents exploit their children for current income purposes at the expense of their children's future, a more likely reason that parents will underinvest in their children's schooling is that parents cannot borrow against the future earnings of their children. Becker and Tomes (1986) showed that if households are credit constrained, they will underinvest in their children's schooling, but all intergenerational transfers will be in the form of human capital and not wealth. This may be why there is a stronger apparent tie between parental and children's schooling in developing than in developed countries. In the latter, credit constraints may not be important (Carneiro and Heckman, 2003; Cameron and Taber, 2004), whereas many poor families in developing countries are likely to face credit constraints that will limit their children's schooling opportunities.

---

<sup>4</sup> Haveman and Wolfe (1984) have a detailed review of the sources of private and social returns to schooling.

**Table 1: Percent of youth 15-19 years old not completing grade 5 by region and by dropout versus never starting school**

Sample	Africa		Asia		Latin America		Middle East
	East-South	West-Middle	East-Pacific except China	South	Central	South	North Africa
	[15]	[20]	[11]	[6]	[10]	[9]	[3]
<b>All children</b>							
Not completing <sup>a</sup>	40.9%	46.5%	12.6%	32.2%	17.5%	14.3%	19.1%
Never starting <sup>b</sup>	14.4%	24.6%	2.6%	17.1%	6.9%	0.8%	7.4%
Drop out <sup>c</sup>	26.5%	21.9%	10.0%	15.1%	10.6%	13.5%	11.7%
<b>Males</b>							
Not completing <sup>a</sup>	39.9%	40.9%	13.1%	25.0%	18.1%	16.5%	15.2%
Never starting <sup>b</sup>	12.5%	20.7%	2.4%	11.1%	7.8%	0.9%	4.2%
Drop out <sup>c</sup>	27.4%	20.2%	10.7%	13.9%	10.3%	15.6%	11.0%
<b>Females</b>							
Not completing <sup>a</sup>	41.9%	51.9%	11.9%	39.9%	16.8%	12.2%	22.9%
Never starting <sup>b</sup>	16.7%	28.5%	2.8%	23.5%	6.1%	0.7%	10.6%
Drop out <sup>c</sup>	25.2%	23.3%	9.2%	16.3%	10.7%	11.5%	12.3%
<b>Urban</b>							
Not completing <sup>a</sup>	20.4%	29.0%	7.3%	18.5%	11.4%	10.6%	10.6%
Never starting <sup>b</sup>	5.0%	13.2%	1.6%	8.1%	4.4%	0.6%	3.2%
Drop out <sup>c</sup>	15.4%	15.7%	5.7%	10.4%	7.0%	10.0%	7.4%
<b>Rural</b>							
Not completing <sup>a</sup>	46.6%	56.8%	15.1%	37.6%	23.9%	29.0%	27.9%
Never starting <sup>b</sup>	16.3%	30.6%	2.9%	20.6%	8.9%	1.7%	11.4%
Drop out <sup>c</sup>	30.3%	26.2%	12.1%	17.0%	15.0%	27.3%	16.5%
<b>Bottom two household income quintiles</b>							
Not completing <sup>a</sup>	55.0%	64.7%	24.0%	54.0%	44.6%	15.3%	35.2%
Never starting <sup>b</sup>	22.2%	36.8%	5.5%	27.8%	8.9%	1.7%	15.2%
Drop out <sup>c</sup>	32.9%	28.0%	18.5%	26.2%	35.8%	13.6%	20.0%

A The share of 15-19 year-olds who did not complete grade 5.

B The share of 14 year-olds who never attended school.

C Estimated share of 15-19 year-olds who started school but dropped out before completing grade 5

Source: Authors compilation of data compiled by Deon Filmer from the most recently available household surveys conducted in each of 86 developing countries between 1997-2005.

<http://www.worldbank.org/research/projects/edattain/>. Population-share weighted averages of countries in the region. Number of countries included in the regional average is in brackets

The best evidence regarding these credit constraints is that in multiple settings and circumstances, child schooling appears to be atypically sensitive to unforeseen fluctuations in household income, positive or negative. Edmonds et al (2005) found that unexpected pension income raised schooling of grandchildren in South Africa. In Vietnam, rapid economic growth and expansion of international trade led to surges in household income that increased child schooling (Glewwe and Jacoby, 2004; Edmonds and Pavcnik, 2006). Negative household income shocks had the opposite effect on schooling. Unforeseeable adverse weather conditions caused poor households to reduce child time in school (Jacoby and Skoufias, 1997, 1998) in India. Adverse macroeconomic shocks due to recessions in Costa Rica (Funkhouser, 1999) or a financial crisis in Indonesia (Thomas et al., 2004) lowered school enrollments. Job losses by parents in Brazil led to increased child labor and school dropout (Duryea et al, 2007). There is evidence that better educated parents can absorb these shocks more effectively (Glewwe and Hall, 1998), and so the adverse consequences of income shocks are borne disproportionately by children at the lowest socioeconomic strata.

Underinvestment in schooling by poor households means that the level of national skills will be lower than optimal. Furthermore, the underinvestment will be concentrated among poor children who will then be consigned to poverty in the future due to their poor human capital endowments. Thus government provision of schooling can also be justified as a means of equalizing the opportunity to escape poverty across households of varying economic status.

#### ***Why focus on early interventions in schooling decisions?***

Countries subsidize education at all levels, primary, secondary and tertiary, and a case can be advanced that developing countries need to expand their human capital at all levels. Nevertheless, on both theoretical and empirical grounds, the greatest returns to human capital investments will be those that occur early in life. One reason is that at young ages, the direct costs of schooling are lower. Glewwe and Kremer (2006) report that in low-income countries, per pupil expenditures at the primary level average 55% of that at the secondary level, and tertiary schooling would cost much more. In settings where teaching represents 74% of the recurring costs of schooling, the supply of those with the requisite skills to teach at the primary level is more abundant than at higher grades. Similarly, the cost of school supplies rises with the level of schooling.

A second reason is that the opportunity costs of schooling is smallest at the youngest ages when children can only make modest contributions to the family's economic circumstances. As they age and develop physically, children's value of time outside of school rises with their capacity to produce goods and services in the home and the marketplace.

However, the most important reason that schooling investments have the greatest return early in life is the impact of early investments on the capacity to learn and earn later in life. There is the long-known fact that early investments will have a longer period of time to capture the returns from schooling (Becker, 1993). More recently, we have learned that early attainment of cognitive skills raises the ability to acquire additional skills later in life (Cunha and Heckman, 2008). For that reason, delays in the acquisition of skills due to later school entry or periodic absence can permanently retard children's lifetime human capital and earnings capacity.

Carneiro and Heckman (2003) and Heckman and Masterov (2007) present a wealth of evidence that earlier investments in human capital including those occurring before the start of the formal schooling are far more cost effective than efforts to improve schooling later in life. Numerous adult pathologies including poverty, low earning capacity, criminal activities, drug

abuse, idleness and chronic illnesses can be linked to a weak human capital foundation in the form of malnutrition, bad health and poor schooling experienced at the youngest ages.

Our point is not that public or private investments in human capital at later stages in life are not valuable. Rather, in an exercise aimed at identifying the highest returns to investments of scarce development resources, the highest return to educational investments will be to those that occur at the youngest ages and the lowest schooling levels.

## 2 THE SOLUTION: LOWERING SCHOOL FEES

There are many avenues that could be used to raise schooling levels. Although governments remain the main financiers of education at the primary level, private agents pay a significant share in many countries. Similarly, actual delivery of schooling services can be from public or private sources. Table 2 summarizes some of the common options. Some countries make a sharp distinction between the role of the public sector as education financier and that of the private sector as education provider. The Netherlands locates in cells B1 and B2, funding all education publicly including private schools, which enroll more than two-thirds of all students. Chile relies on publicly funded and provided schools (B2) but provides vouchers to some of the students who attend private schools (B1). Several African countries have different ways of public financing of privately delivered schools including government-subsidized independent schools (The Gambia), partially subsidized mission or religious schools (Lesotho), and partially subsidized community-organized schools (Kenya). Most developing countries mandate partial private support of public schools (A2) through tuition or fees. Finally, almost all countries also have privately financed and delivered educational services (A1).

**Table 2: Financing and Provision of Services in Public-Private Partnerships**

<u>Finance</u>	<u>Provision</u>	
	<u>1: Private</u>	<u>2: Public</u>
<b>A: Private</b>	<b>A1:</b> Private Schools Home School Tutoring	<b>A2:</b> User Fees Student Loans
<b>B: Public</b>	<b>B1:</b> Vouchers Charter Schools Contract schools Capitation Grants	<b>B2:</b> Public Schools

In this paper, we focus on mechanisms for lowering the costs of schooling to parents in cells A1, A2, and B1. These mechanisms have several forms, of which three we feel have the best proven records: 1) Intervention in A2 through nation-wide elimination of formal and informal tuition and fees; 2) Intervention in B1 through capitation grants and vouchers targeted to groups with lagging educational attainment; and 3) Intervention in A1 through subsidies that lower the cost of tutors or other enhanced learning opportunities for poor children. We will provide details on each of these strategies in turn. But first, we review evidence on the incidence and magnitude of school fees parents must pay to send their children to primary school. While many countries have lowered these fees in recent years and others have dispensed with formal fees, we find that informal fees and payments for school materials remain a significant hindrance to attaining UPE.



***Primary school fees are commonly charged in developing countries***

In 2005, the World Bank commissioned a survey of primary school fees in 93 developing countries (Kattan, 2006). The findings show a strong trend toward reducing the price of attending primary school in developing countries. Whereas only 3 countries offered free primary schools before 2000, 16 had eliminated all school fees by 2005. Only 18% of the 93 developing countries officially charge tuition for primary schools.

However, the vast majority of parents in developing countries still face private costs of sending their children to primary school, even in countries that do not charge official tuition. As shown in Table 3, informal tuition is charged in 7% of the countries, raising the percentage charging primary school tuition to 25%. Furthermore, countries charge a variety of fees associated with primary schooling, even when there is no tuition. Of the 69 countries that have free primary school tuition, only 16 actually offer free access to primary schools. The rest of the countries have alternate fees related to school access. In at least one –quarter of the countries, parents are charged for textbooks. Over one-third of the countries charge for uniforms and for other fees associated with school activities.

The most common of these is a fee charged by a Parent-Teacher Association or other community association that supports the school. While these fees may be voluntarily in some locales, failure to pay can lead to expulsion in others. Often these informal fees have been introduced as tuitions have been decreased, minimizing any positive effect of tuition reductions on enrollments.

Overall, 63% of the developing countries have official policies to charge at least one of the five types of primary school fees listed in Table 3. On top of that, informal fees are charged in 35% of the countries. Combining informal and formal fees, parents in 84% of the developing countries have to pay to send their children to primary school. These fees are required in virtually all parts of the world. They are found in 82% of the countries in Africa, 63% of the South Asian countries, 79% of the Latin American countries, and 92% of the countries in East Asia.

**Table 3: Percentage of developing countries charging primary school fees by region, 2005**

	<b>Africa</b>	<b>East Asia</b>	<b>South Asia</b>	<b>Eurasia</b>	<b>Latin America</b>	<b>Middle East North Africa</b>	<b>Total</b>
<b>Tuition fees</b>	26%	25%	0%	20%	31%	40%	<b>25%</b>
<b>Textbooks</b>	17%	41%	0%	20%	31%	10%	<b>25%</b>
<b>Uniforms</b>	32%	41%	25%	10%	63%	20%	<b>35%</b>
<b>Parent Teacher Associations and Community Fees</b>	67%	91%	50%	90%	73%	60%	<b>69%</b>
<b>Other</b>	35%	58%	37%	40%	36%	30%	<b>36%</b>
<b>Official fees</b>	65%	75%	50%	90%	63%	80%	<b>63%</b>
<b>Unofficial fees</b>	32%	58%	38%	30%	42%	40%	<b>35%</b>
<b>Any Fee</b>	<b>82%</b>	<b>92%</b>	<b>63%</b>	<b>100%</b>	<b>79%</b>	<b>90%</b>	<b>84%</b>

Source: Author's compilation of data reported in Kattan (2006) Annex 3. Original data taken from World bank surveys conducted in 2005 in 93 developing countries.

These fees can be a significant burden on parents, particularly for the poorest households. Across 34 countries for which fee information was available, primary school fees represented over 10% of average household expenditures in 6 and between 5-10% in another 6. The burden is greatest on the poor. A study by Oxfam (2001) found that the poorest two household income quintiles in developing countries on average spend more than 10% of their incomes on primary schooling. A study of household expenditure patterns in Bangladesh, Nepal, Uganda and Zambia found that only food (and in one case, clothing) takes a greater share of household expenditures in those poor countries (Boyle et al, 2002).

### ***School fees adversely affect enrollments of disadvantaged groups***

Numerous studies have shown that the price of schools, measured in tuition or distance, have a sizeable negative effect on school enrollment (Gertler and Glewwe, 1990; Lavy 1996; Alderman et al., 2001; Bedi and Marshall, 2002; Glick and Sahn, 2006). As summarized by Orazem and King (2008), school fees have had an atypically large impact on the poor. Available empirical data is lacking, but one might expect that the demand for schooling of girls and of rural children would also be more sensitive to schooling prices. If true, programs that uniformly reduce the price of primary schooling for all children will disproportionately increase enrollments of girls, rural children and the poor, the very groups that, as we have shown, lag in education outcomes.

Evidence from general reductions in school fees are consistent with these expectations. Kattan's (2006) review of the empirical record found large increases in enrollment in the countries that eliminated primary school fees. In the subset of countries where more detailed analysis is available, the largest increases in enrollments were for poor, female, and rural children. Additionally, general fee reductions in Kenya, Lesotho and Tanzania led to rising enrollments for orphans and children of parents with HIV/AIDS.

These findings of large enrollment responses to school fee reductions hold up in more careful evaluations that control for competing explanations. The *Gratuidad* program in Bogota, Colombia launched in 2004 offered fee reductions to students from the poorest families. A rigorous evaluation conducted by Barrera-Osorio et al (2007) found that the program raised enrollments of primary-aged students by about 3 percentage points and of secondary enrollments by about 6 percentage points. The largest effects were for at-risk students.

Fafchamps and Minten (2007) took advantage of a unique political crisis that led to reductions in education and other public service fees in Madagascar. The fee suspensions were not applied immediately in all rural communes, and so the authors could compare enrollment changes in areas with and without user fees. They found that suspension of user fees resulted in significant increases in school enrolment.

Even partial fee reductions can have substantial impacts on enrollments. A program that cut household costs of uniforms and school materials in Kenya at a cost of about \$15 per child, increased years of schooling completed by 15% (Kremer, Moulin and Namunyu, 2003).

### ***Do reductions in school fees threaten school quality?***

A potential problem with reliance on user fee reduction or elimination is that they may be too successful: the resulting enrollment expansion may tax available space in schools. In Uganda, for example, fee elimination led to an increase in pupil teacher ratios from 48:1 to 70:1 in rural areas and from 38:1 to 65:1 overall. This tradeoff between increased schooling demand and reductions in the quality of schooling appears to be a general characteristic of programs aimed at reducing user fees. Tiongson's (2005) review of 20 studies across 10 countries found that in all

cases, enrollments rose. But, in the 15 studies that considered the issue, measures of school quality fell in every case but one.

The loss in quality is not surprising - fees paid by parents can be a high fraction of the total financial support for a school. In developing countries where the taxing authority is weak, charging a fee for services rendered may be the only way for public agencies to recover costs. It is not surprising that the elimination or reduction of those fees creates a strain on service delivery and quality, or that elimination of official fees often is accompanied by increases in informal fees.

The children who were already in school may be negatively affected when these programs raise the number of students per teacher. Again, the Uganda case provides a useful example. Grogan (2006) found that following the fee reduction, there was a 10 percent decrease in the probability that a publicly-schooled child was able to complete a simple reading test. Nishimura et al (2008) found an increased likelihood that children who start school will drop out before completion following the fee reduction.

We should emphasize that any program that increases enrollments atypically for the most disadvantaged groups would almost certainly result in a reduction in average measures of academic success. That is because the population of children in school will be weighted more heavily toward groups who would be expected to have more difficulty in school. The better measure of the net gain versus loss from the program is whether the cognitive gains from increased enrollments outweigh the losses attributable to overcrowding and reduced school quality. As we argue below, it appears that in Uganda, the benefits outweigh the costs.

### ***Ways to reduce user fees without sacrificing school quality***

The often large responses to school price reductions are the best evidence supporting demand-side efforts to improve literacy. In contrast, efforts to encourage additional school enrollments by building more schools have much smaller results. For example, when Indonesia doubled the number of its public schools in the 1970s, average years of schooling completed rose only modestly (Duflo, 2001). From a cost-benefit perspective, fee reductions are much less expensive than bricks and mortar expansions and have much larger behavioral responses. Nevertheless, there is a significant concern that these large enrollment increases can overtax the ability of the country to provide a productive school environment.

While we have demonstrated that the fraction of dropouts is large relative to the total number of children failing to complete the primary cycle and so potential capacity exists to meet their needs, in practice we know that some children will enter school who previously would not have enrolled at all. These first-time entrants will increase the number of children relative to teachers and will eventually necessitate additional resources in order to maintain quality.

There are two distinct ways in which reductions in user fees can reduce school quality. First, reducing fees reduces the financial resources available for funding schools (and the teachers in them). If no funds are acquired from other sources to replace the funds lost from a reduction or elimination of fees, then spending per student will decrease even if no additional students enroll as a result of the reduction in fees. Second, major fees reductions or the complete elimination of fees will increase the number of children enrolled in school, and this will put an additional strain on schools, the most immediate effect being large increases in class size.

Some have argued that reductions in school fees must be accompanied by a commitment to increase public financial support to schools to replace the lost revenues. The strongest support for this view comes from the literature on user fees in health care. Removal of user fees increases usage, especially by the poor. A review of 27 studies suggests that this policy has been most successful when supported by supply-side measures that remove other barriers to access (James et al, 2006). However, there are mechanisms by which demand-side measures can still increase utilization without sharply reducing school resources.

The most obvious way to reduce fees while minimizing revenue losses is to target the fee reduction to the most disadvantaged groups: the poor, female, rural, disabled or minority children who are underserved by the current system. In particular, fee reductions should focus on age, gender or regional groups that are not already sending their children to school so that the money is focused on individuals who are not already completing the primary cycle. Such "targeting" will maintain payments from those best able to pay, who are already enrolled in school, while increasing enrollments of the most vulnerable. There is considerable experience with local targeting to identify those most deserving of public transfers at relatively low cost (Alderman, 2001; Faguet, 2004; Galasso and Ravallion, 2005). Such efforts would lower the adverse impact of fee reductions or elimination on the financial resources available for education, and thus will help maintain school quality for those already in school.

Countries may find it difficult to target on household income. Information on household income is typically not available. Even if available, poor households have highly variable income streams and may move fluidly from one side to another of an income threshold. Even more problematic, households may alter their income in order to qualify for the schooling subsidy. A low cost alternative is to target on the education of the parents. Glewwe and Hall (1998) showed that the least educated households are the most vulnerable to adverse shocks that could affect their ability to keep their children in school, and so parental education is an easily observable alternative to income as a targeting criteria. In addition, since parental education cannot be altered by parents there are no perverse incentive effects; in contrast, an income threshold provides an incentive for parents to lower their income to obtain reduced tuition.

The second problem, that increased enrollment will reduce school quality even if financial resources are unchanged, is more difficult to solve. Yet it may be that increases in class size do not have as serious negative effects on student learning as some may think.<sup>5</sup>

***The private sector may be induced to provide some of the necessary supply***

The most promising mechanisms to reduce schooling costs without sacrificing quality is to provide the targeted poor with the resources needed to pay for the costs of the schooling. These vouchers could be used for support of public or quasi-public schools through the use of capitation grants, per pupil payments that are made directly to the school. Thus they provide an incentive for private suppliers to open new schools in areas where the current local supply is insufficient. Finally, they can be directed to utilize existing excess capacity in private schools if the existing public schools are oversubscribed. There are successful examples of each of these mechanisms to maintain school quality in developing countries, which we will review below.

The availability of less expensive teaching and infrastructure inputs is a major reason to consider private rather than government school options to serve the expanding demand for

---

<sup>5</sup> See Glewwe and Kremer (2006) for a review of recent evidence.

schooling. James (1993) demonstrated that in many developing countries, private schools are an important component of school supply. In many countries, private schools have excess capacity as measured by their relatively low numbers of students per teacher. In addition, private schools may have a lower marginal cost of adding additional capacity than do government schools. In these circumstances, modest public subsidies that induce private school suppliers to contribute additional resources may increase enrollments at a fraction of the cost of pure public provision of schooling.

### 3 ALTERNATIVE CASE EXAMPLES FOR FEE REDUCTION

#### ***Uganda: The case for national reduction in fees***

In 1997, Uganda removed school tuition as part of its program to achieve UPE. Note that in Uganda, fees are still charged legally for textbooks, uniforms, and other school functions, and so primary school is still not completely free. Nevertheless, Deininger (2003) found that elimination of primary school tuition lowered costs by an average of 60% on average or by \$16 per child. As a result, enrollments increased by 60%. Consistent with the presumption of larger school price elasticities in rural areas, rural enrollments more than doubled while urban enrollments rose by only 16%. Grogan (2006) and Nishimura et al (2008) found that the reduction in fees in Uganda also led to a reduction in delayed enrolments. The Nishimura et al analysis concluded that grade completion rates up to the fifth grade rose, with especially large effects among girls from poor households.

As mentioned above, there were costs associated with the elimination of fees in Uganda. The surge in enrollments led to overcrowded schools and increased school failure rates. Nevertheless, it seems that the gains clearly outweighed the losses. Even with a 10% increase in academic failures conditional on having entered school, the estimate reported by Grogan, the successes more than offset the failures. With enrollments increasing by 60%, the implied fraction of children attaining literacy increased by 44% after taking into account the rising failure rate.

In Table 4, we summarize the estimated benefits and costs of inducing a child to spend an additional year in school as a consequence of the Uganda policy of eliminating school fees. Using the information above, we know that the policy cost about \$16 per child in order to induce a 44% increase in children going to and succeeding in school. The fee reduction was not targeted, and so 2.3 students who would have gone to school anyway also received the benefit for every new student who entered and succeeded. The full cost of the subsidy is therefore about \$52 per added child-year in school.

The surge in enrollments put an added burden on existing school capacity, and so we presumed that additional resources equal to the average primary cost per pupil would have to be added to the subsidy. Based on per pupil costs reported by Jørgensen (2006), we estimate that the per pupil cost of adding teachers, implied rent of facilities, and necessary school supplies is roughly \$65 per child. As the initial increase in enrollments was 60%, that means we added roughly 1.36 children to primary school for every 1 that attained literacy, or about \$88 in added school costs per successful child-year in school. Adding the school costs to the subsidy costs, the Uganda program spent \$140 per added child-year in school.

**Table 4: Overview Table of Benefit-Cost ratios from various efforts to reduce illiteracy**

	Low Discount (3%)			High Discount (6%)		
	Benefit	Cost	BCR	Benefit	Cost	BCR
<b>Scholarship/Voucher Programs</b>						
Uganda free primary school program	612!	\$140!	4.4	395!	\$140!	2.8
Pakistan urban girls' scholarship	\$1572!	108!	14.6	\$1014!	\$118!	8.6
Pakistan rural girls' scholarship	\$1258!	\$311!	4.0	\$811!	\$326!	2.5
Colombia: PACES secondary school urban voucher, value of years of schooling only <sup>a</sup>	\$918	\$193	4.8	\$592	\$190	3.1
Colombia: PACES secondary school urban voucher, value of years of schooling and improved cognitive skills <sup>a</sup>	\$8574	\$193	44.4	\$5529	\$190	29.1
India <i>balsakhis</i> tutorial program <sup>b</sup>	\$2899!	\$9.9!	293	\$1869!	\$9.8!	191

!Per year of schooling induced

<sup>a</sup> Estimates based on data presented in Knowles and Behrman (2005)

<sup>b</sup> Estimates based on data presented in Banerjee, Cole, Duflo and Linden (2007)

We assume that a successful year in school will yield a permanent return of 8% increase in earnings. Using the per capita income in Uganda of \$300,<sup>6</sup> that suggests that completing one year of school in Uganda will return additional annual income of \$24. If the child will have productive use of the human capital generated in that year over 45 years, the present value of the induced income increase is \$612 at a discount rate of 3% or \$395 at a discount rate of 6%. Both far exceed the cost of \$140 per child-year of schooling.

Our estimate of the returns per year of schooling presume that these children will make productive use of their schooling as adults and that the return they will receive is consistent with the rates of return we found for developing countries in past studies. It may be that the sudden surge in human capital induced by the elimination of school fees will depress the returns relative to the past or that the quality of schooling will be eroded so that the human capital produced per year will fall below past levels. Nevertheless, the estimated benefits are so large relative to the costs that even if our presumed returns exceed actual by 100%, the benefit-costs ratios would still be substantially greater than one.

<sup>6</sup> We use per capita incomes computed at official exchange rates. Per capita incomes are considerably larger at purchasing power parity, and so use of PPP income would result in even larger benefit cost ratios. Per capita incomes are also smaller than incomes per economically active individual, and the use of the latter would also raise benefit cost ratios. We opted for the more conservative measure to avoid exaggerating the benefits of our schooling interventions.

### ***Balochistan Province, Pakistan: The urban and rural girls scholarship schools***

In many countries, the public sector is constrained from providing schooling services even when potential local demand is strong. The government may not have the resources to expand school supply to keep pace with rising demand. Or governments may face constraints on school expansion due to bureaucratic rules that limit the ability to acquire land or facilities.

An example of this is found in urban squatter settlements in Pakistan. As a prerequisite for obtaining a government school building, the local community was required to provide the land. In many cities, neighborhoods sprang up on government land. Houses were built on land without any established property rights. The neighborhood could not provide title to land for the school, and government rules even limited the use of existing buildings. In settings where the government cannot provide schooling services directly, they can lower the costs to parents of sending their children to private schools.

One way to accomplish this objective is through capitation grants to school operators. A program in Balochistan province in Pakistan attempted to spur both the demand for schooling among girls and to provide an incentive for private school entry by providing scholarships to girls. Randomly selected neighborhoods were given the option of packaging up to 100 girls' scholarships of 100 rupees per month (equivalent to \$3) to try to induce a school operator to open a school in the area. The scholarship offered declined over time, falling to zero after four years. In urban areas, even this modest subsidy was sufficient to induce new private schools to open (Kim, Alderman and Orazem, 1999), and enrollment for both girls and boys rose relative to enrollment in control neighborhoods.

A similar program in rural areas was successful in getting schools to open. However, the communities were too poor and the number of girls too few to allow the schools to become self-sustaining (Alderman, Kim and Orazem, 2003). The benefits of the rural program were sufficiently large that they would justify a continued government subsidy beyond the pilot period, but the program was intended to end after four years after which the local community would be responsible for all school costs. This raises an important lesson for the likely success of private school options to raise enrollments - invariably they will be most successful in areas that would have been able to support private schools in the absence of a subsidy, in other words, places with the greatest elasticity of supply for private schools.<sup>7</sup>

In the Balochistan case, the privately managed scholarship schools were opened at one-quarter of the cost of a public school, in part because the schools were able to obtain access to property at a much lower cost than building a school, and because the schools were able to hire teachers at well below the government pay scale. Despite that fact, school quality was sufficiently high that students in the newly formed scholarship schools outperformed students from similar backgrounds in government schools.

Alderman et al (2003) provide details on the costs of the Pakistan urban and rural girls scholarship pilot programs. In the urban case, schools received a monthly subsidy of 150 rupees per girl in the first year, 135 rupees per girl in the second year, 100 rupees per girl in the third year and zero in the fourth. In each of the first four years, schools also received an enrollment fee of 200 rupees per girl. Because the costs are incurred over time, we compound them forward to the end of year four. Compounding at 3% per year and using an exchange rate of 33.3

---

<sup>7</sup> Orazem and King (2008) present a theoretical argument for where private school vouchers or capitation grants are most likely to succeed.

rupees per dollar, the aggregated cost of inducing a new private school to open was \$17,811. Each school induced an average of 55 more girls to enroll in school an average of three years, and so the average cost per child-year of schooling at the end of four years was \$108. At a 6% interest rate, the cost after four years was \$118. Per capita incomes in Pakistan are \$770 at the official exchange rate, and so assuming an 8% return per school year, the implied increase in income per year of induced increase in schooling was \$62. Evaluated at the end of year four, the income stream has a present value of \$1572 at a discount rate of 3% or \$1014 at a discount rate of 6%. The implied return from increased schooling swamps the low cost of the subsidy necessary to induce the schools to open, and so the benefits far outweigh the costs.

The rural girls' scholarship program was considered a failure because the schools could not generate a sufficiently large income to become self-sustaining. Nevertheless, the induced enrollment increase was sufficiently large to justify the program. The rural girls' schools induced only three more students to attend school on net, as more girls but fewer boys attended school in these rural villages. The cost per added child-year in school was \$311 at a 3% interest rate. We assumed that rural incomes would be 80% of the country average, and so each induced year of school would add \$49 of annual income. Even these conservative assumptions generate benefits that exceed the costs.

#### ***Colombia: The PACES school voucher program***

In areas where existing private schools are undersubscribed, vouchers may be an useful mechanism by which governments can expand access less expensively than by building additional government schools. One example of this strategy was the Colombia PACES program that provided subsidies to municipalities to provide secondary school vouchers to poor children. There was ample evidence that the existing government school supply was insufficient to meet demand, and that private schools could add additional students with no need for additional teachers or classrooms (King, Orazem and Wohlgemuth, 1999). Vouchers were offered only to children in the lowest socioeconomic strata in municipalities where private schools had committed to participate. At a 3% discount rate, the program cost \$193 over three years of schooling (Knowles and Behrman, 2005). This cost involves just the subsidy that goes to the child. There are no additional school costs because the program made use of existing excess capacity in the private schools. However, the opportunity cost of the children's time is higher than would be the case if they were of primary school age.

Angrist et al (2002, 2006) demonstrated that children who were randomly sorted into the program were 10% more likely to complete the 8<sup>th</sup> grade and also scored 0.2 standard deviations higher on standardized tests, equivalent to adding an additional year of school. For those in doubt of external benefits from education, it is interesting that voucher recipients were also less likely to marry young or cohabit and were less likely to engage in child labor. The 2006 analysis confirmed that educational gains were permanent and not transitory.

Knowles and Behrman (2005) estimate that the induced increase in schooling would increase annual earnings by \$36 to \$48. The increased test scores would be even more valuable, raising earning by an additional \$300 per year. Even if there were no improvement in cognitive outcomes, the program's benefits would modestly outweigh the costs. Including the value of the improved test scores, the benefits become much larger than the costs.

#### ***India: The *balsakhis* (school tutor) program for poor children***

A program in India provides a third mechanism to enable poor households to enroll their children in school. In many developing countries, students participate in tutoring after school,



with the tutoring often provided by the same teacher they have in class. Poor children cannot afford these services and may fall behind their peers. Eventually, the children who fall behind may drop out or will be so far behind that they will not pursue additional schooling beyond the primary level.

A program in India hired local women with high school degrees to provide remedial tutoring to grade 3 and 4 children who had fallen behind in school (Banerjee et al, 2007). At a cost of \$5 per child, the program raised the likelihood of a child performing at first grade math level by 11.9 percentage points and at second grade language levels by 9.9 percentage points. By the end of the two year program, children were performing on average 0.28 standard deviations higher on the test scores, roughly equivalent to having attained one additional year of schooling.

The reason the program is so inexpensive is that it hires less qualified tutors at the market rate rather than requiring teaching certification and paying the government rate for teachers. These tutors (called *balsakhis* or children's friends) were paid only \$10-\$15 per month, roughly one-eighth of the salary of government school teachers.

The computation of benefits and costs is relatively uncomplicated. The costs are essentially \$5 per year for two years, presuming that the opportunity cost of child time is minimal. The benefits are substantial, amounting to the return on an additional year of schooling. At a presumed return of 8% increase in income per year of schooling attained, that means the program increased recipient earning by \$114 per year, using the per capita income level for India of \$1420/year. Again the costs are so low that even substantial bias in the presumed income returns will not affect the conclusion that the program is cost effective.

Programs to reduce the costs of schooling to parents can have dramatic and immediate impacts on children's achievement and years of schooling completed. Moreover, they can take advantage of existing underutilized capacity in the form of potential teachers and spaces in private schools at a fraction of the cost of building and staffing new schools. Finally, they have the additional advantage that they use resources only if the children use the services.

#### 4 ESTIMATED COSTS AND BENEFITS OF ENDING DROPPING OUT OF PRIMARY SCHOOL

This section assesses the costs and benefits of programs that appear to be most promising at encouraging students to complete primary school. Using the programs discussed in Section III, this section combines the results in Tables 1 and 4 to calculate a very rough estimate of the costs and benefits of implementing these "best practice" programs in different parts of the developing world. The focus is on the 15 million children born every year in developing countries who start, but do not complete, primary school.<sup>8</sup> About 7.2 million of these children are found in Sub-Saharan Africa, of which 5.5 million are in rural areas and 1.7 are in urban areas. As

---

<sup>8</sup> The returns to schooling will be maximized only in economies that allow individuals to seek the best use of their skills and that protect individuals from the loss of life and property. Each year, many children are born in failed states such as North Korea, Somalia and Zimbabwe, which do not offer the economic freedom to pursue a reward for their skills and/or the security that the return to their skills will not be expropriated by force. Nearly 12% of children born in developing countries are in the 10 most failed states, as reported in the July/August 2008 issue of *Foreign Policy* available at [http://www.foreignpolicy.com/story/cms.php?story\\_id=4350](http://www.foreignpolicy.com/story/cms.php?story_id=4350)

shown in Table 5, 2.9 million rural dropouts and 600,000 urban dropouts reside in the south and eastern countries of Africa. In western and central countries of Africa, the comparable numbers of children dropping out of primary school per birth cohort include 2.6 million in rural areas and 1.1 million in urban areas. Efforts to attain universal primary enrollment in Africa are complicated by the fact that 77% of African primary school dropouts reside in rural areas.

**Table 5: Estimated cost of bringing primary dropouts to primary completion, by region, assuming that we need to add 2.5 years of schooling on average**

Region	Rural children (millions)	Cost per child- year induced	Total Expense (million \$/yr)	Urban children (millions)	Cost per child-year induced	Total Expense (million \$/yr)
East-South Africa	2.9	\$140	\$1002	0.6	\$140	\$195
West Middle Africa	2.6	\$140	\$918	1.1	\$140	\$388
East Asia	0.8	\$300	\$570	0.3	\$150	\$103
South Asia	4.3	\$300	\$3219	1.2	\$150	\$433
Latin America	0.6	\$200	\$287	0.8	\$200	\$393

Total 11.1 11.1 \$5996 3.9 \$1512

Total children

served (millions) 14.99

Total cost

(million \$) \$7508

We assume that, on average, a primary school dropout leaves school with 2.5 years left to completion. Using the Uganda case as a measure of the cost of inducing an additional year of completed schooling in Africa, it would cost \$140 per child-year of schooling added. This was the average across urban and rural areas, and so we apply it to both urban and rural groups. The most appropriate strategy for countries in Sub-Saharan Africa is to induce added enrollments by eliminating primary school fees. The cost of getting one cohort of primary school dropouts to complete an average of about 2.5 additional years of schooling needed to complete the primary cycle is \$2.5 billion (Table 5, columns 3 and 6).

Turning to Asia, there are 6.5 million children born each year who will start, but not complete, primary school. As with Africa, the problem is primarily in rural areas, where 78% of primary dropouts reside. Particularly in South Asia, most of the dropouts are girls. In many of these areas, dropping out is exacerbated by extreme poverty and by the lack of apparent returns to schooling. In urban slums, the dropout problem is exacerbated by overcrowding in existing government schools and constraints on public school expansion. In this region, efforts to tie

reduced schooling costs faced by parents to enhanced private school delivery, as with the capitation grant programs, seem most promising. Nevertheless, such programs are more costly in rural than in urban areas because of the difficulty of finding qualified teachers who are willing to work in rural areas.

Using the Pakistan girls' scholarship costs as a reference, and rounding to make the numbers more transparent, we assume the cost per child-year of schooling induced will be \$300 in rural areas of Asia and \$150 in urban areas. In East Asia, the target population includes 760 thousand rural and 275 thousand urban primary dropouts. In South Asia, the target includes 4.3 million rural and 1.2 million urban children. Assuming that the goal is to induce an additional 2.5 years of schooling on average, and applying the rural and urban cost assumptions, the total cost of adding 6.8 million primary completers per birth cohort in Asia would be \$4.3 billion.

In urban areas, these costs could be reduced somewhat if the issue is not inadequate public school capacity but rather a poor home environment supporting child schooling. The Balsakhis program is not expensive and seems promising for both boys and girls. Implementing this in urban areas of Asia would cost only \$25 (\$10 per induced child-year of schooling times 2.5 years needed on average per child) rather than \$425 per added primary graduate. This strategy would work only in urban areas with ready supplies of potential tutors and is unlikely to work in rural areas, where the largest problems are found. Nevertheless, use of the Balsakhis program could cut our estimated cost of addressing inadequate schooling in Asia by \$572 million.<sup>9</sup>

Finally, consider Latin America, where 1.4 million children are born each year who will start primary school but not complete it. In this region, efforts to attain universal primary enrollment will have a more urban emphasis, as 58% of the primary dropouts reside in urban areas. Vouchers will work best in urban areas where there is a preexisting private school capacity. It should be noted that it is also in Latin America that cash transfers tied to children remaining in school have been used most extensively and have met with some success. Using the costs of the Colombia voucher program as a guide, our rough estimate of the cost of inducing an additional child-year of primary schooling is about \$200. We estimate that the cost of inducing 1.36 million primary school dropouts in Latin America to complete an average of 2.5 additional years of schooling, at a cost of \$200 per child per year, comes to about \$680 million.

Across these regions, the total cost of adding nearly 15 million more children to the ranks of the literate is \$7.5 billion per birth cohort (i.e. \$7.5 per year). However, there are two important caveats to the rough estimates in Table 5. First, they do not include children in North Africa, China, and Eastern Europe and Central Asia, for which we do not have a clear idea about what programs would work and how much they would cost. About 11% of the children who start but do not complete primary school are in North Africa, yet many these countries should have sufficient income from oil revenues to devise programs to ensure that all children complete primary school. In the other regions (China, Eastern Europe and Central Asia), the great

---

<sup>9</sup> The cost differential from the use of the Balsakhis program rather than the capitation grant yields savings of \$425-\$25 = \$400 per induced primary graduate. With 1.43 million urban dropouts in Asia, the aggregated cost saving from the use of the Balsakhis program rather than the capitation grant is \$400\*1.43 million.

majority of children are already completing primary school and further intervention is not necessary.

Second, these estimates are based on only four programs and so assume that a program that works well in one country in a given region will also work well in other countries in that region. This assumption could be inaccurate for many countries, which is why these estimates should be regarded as imprecise approximations.

## 5 CONCLUSIONS

We have shown that parents are quite sensitive to reductions in the costs of sending their children to public or private schools. Policies that alter these costs can have large impacts on the fraction of children finishing primary school. Using past evidence on the impact of a year of schooling on income in developing countries to project the returns to these policies, we show that benefits of these policies are likely to far outweigh their modest costs.

To put our strategy in perspective, we estimate that every year, approximately 15 million children who start schooling but will drop out before completing grade 5 could be induced to complete grade 5, and thus attain literacy, in a cost-effective manner. We take the fact that the children started school as evidence that there is some source of school supply in close proximity to the home, and so it is the demand side that is constraining their completion of five years of schooling. We have shown that various methods that lower the parents' price of schooling have successfully stimulated increased enrollments in a wide variety of developing country settings. We have also presented a rough estimate, based on a small number of successful programs, that 15 million children who currently start primary school but do not finish would be able to finish, and thus attain basic literacy, if about \$7.5 billion per year were spent on these programs.

## REFERENCES

- Alderman, Harold. (2001) "Multi-Tier Targeting of Social Assistance: The Role of Intergovernmental Transfers." *The World Bank Economic Review* 15: 33-53.
- Alderman, H., P.F. Orazem and E.M. Paterno (2001) "School quality, school cost and the public/private school choices of low-income households in Pakistan." *Journal of Human Resources* 36: 304-326.
- Alderman, H., J. Kim and P.F. Orazem (2003) "Design, evaluation, and sustainability of private schools for the poor: the Pakistan urban and rural fellowship school experiments." *Economics of Education Review* 22:265-274.
- Angrist, J. D., E. Bettinger, E. Bloom, E. M. King and M. Kremer. (2002) "Vouchers for Private Schooling in Colombia: Evidence from a Randomized Natural Experiment," *American Economic Review* 92 (5, December): 1535-59
- Angrist, Joshua D., Eric Bettinger, and Michael Kremer. (2006) "Long-Term Educational Consequences of Secondary School Vouchers: Evidence from Administrative Records in Colombia." *American Economic Review* 96:847-862.
- Banerjee, Abhijit, Shawn Cole, Esther Duflo and Leigh Linden (2007). "Remedying Education: Evidence from Two Randomized Experiments in India." *Quarterly Journal of Economics* 122(3):1235-1264
- Barrera-Osorio, Felipe, Leigh L. Linden and Miguel Urquiola. (2007) "The Effects of User Fee Reductions on Enrollment: Evidence from a Quasi-experiment." World Bank. Mimeo.
- Becker, Gary S. (1993) *Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education*, 3<sup>rd</sup> edition. University of Chicago Press.
- Becker, Gary S., and Nigel Tomes. (1986) "Human Capital and the Rise and Fall of Families." *Journal of Labor Economics* 4: S12-S37.
- Bedi, Arjun S. and Jeffrey H. Marshall (2002) "Primary school attendance in Honduras," *Journal of Development Economics* 69(1): 129-153
- Boyle, Siobhan, Andy Brock, John Mace And Mo Sibbons. (2002) "Reaching the Poor: The 'Costs' of Sending Children to School." U.K. Department for International Development.
- Cameron, Stephen V., Taber, Christopher. (2004) "Estimation of Educational Borrowing Constraints Using Returns to Schooling." *Journal of Political Economy* 112: 132-182.
- Carneiro, Pedro and James Heckman. (2003) "Human Capital Policy," in James J. Heckman and Alan J. Krueger. *Inequality in America: What Role for Human Capital Policies?* Cambridge, MA: MIT Press.
- Cunha, Flavio and James J. Heckman. (2008) "Formulating, Identifying and Estimating the Technology of Cognitive and Noncognitive Skill Formation." *The Journal of Human Resources* 43 (4):738-782.
- Deininger, Klaus. (2003) "Does cost of schooling affect enrollment by the poor? Universal primary education in Uganda." *Economics of Education Review* 22(3): 291-305.
- Duflo, E. (2001), "Schooling and labor market consequences of school construction in Indonesia: evidence from an unusual policy experiment," *American Economic Review* 91: 795-813.

- Duryea, Suzanne, David Lam, and Deborah Levison. (2007) "Effects of Economic Shocks on Children's Employment and Schooling in Brazil." *Journal of Development Economics*, 84 (1): 188-214.
- Edmonds, Eric V., Kristin Mammen and Douglas L. Miller (2005) "Rearranging the Family? Household Composition Responses to Large Pension Receipts." *The Journal of Human Resources* 40: 186-207.
- Edmonds, Eric V. and Nina Pavcnik. (2005) "The effect of trade liberalization on child labor." *Journal of International Economics*. 65 (2): 401-419.
- Fafchamps, Marcel and Bart Minten. (2007) "Public Service Provision, User Fees and Political Turmoil." *Journal of African Economies* 16(3): 485-518.
- Faguet, Jean-Paul. (2004) "Does Decentralization Increase Responsiveness to Local Needs? Evidence from Bolivia." *Journal of Public Economics* 88: 867-894.
- Funkhouser, E. (1999) "Cyclical economic conditions and school attendance in Costa Rica," *Economics of Education Review* 18:31-50
- Galasso, Emanuela and Martin Ravallion. (2005) "Decentralized Targeting of an Anti-Poverty Program." *Journal of Public Economics*. 89: 705-27
- Gertler, Paul and Paul Glewwe. (1990) "The Willingness to Pay for Education in Developing Countries: Evidence from Rural Peru," *Journal of Public Economics* 42: 251-275.
- Glewwe, Paul (2002), "Schools and Skills in Developing Countries: Education Policies and Socioeconomic Outcomes." *Journal of Economic Literature* 40:436-483.
- Glewwe, Paul and Gillette Hall. (1998) "Are Some Groups More Vulnerable to Macroeconomic Shocks than Others? Hypothesis Tests Based on Panel Data from Peru." *Journal of Development Economics* 56: 181-206.
- Glewwe, Paul and Hanan G. Jacoby. (2004) "Economic growth and the demand for education: is there a wealth effect?" *Journal of Development Economics* 74 (1, June): 33-51.
- Glewwe, Paul, and Michael Kremer. (2006) "Schools, Teachers and Educational Outcomes in Developing Countries." in E. Hanushek and F. Welch eds. *Handbook of Economics of Education* Amsterdam: Elsevier Science B.V.
- Glewwe, Paul and Meng Zhao. (2006) "Attaining Universal Primary Schooling by 2015: An Evaluation of Cost Estimates." In J.E. Bloom, D.E. Cohen and M.B. Malin eds. *Educating All Children: A Global Agenda* Cambridge, MA: MIT Press.
- Glick, Peter and David E Sahn. (2006) "The demand for primary schooling in Madagascar: Price, quality, and the choice between public and private providers," *Journal of Development Economics* 79 (1, February): 118-145
- Grogan, Louise. (2006) "Who benefits from Universal Primary Education in Uganda?" University of Guelph. Mimeo
- Hanushek, E.A. and L. Woessmann. (2008) "The role of cognitive skills in economic development." *Journal of Economic Literature* 46(3): 607-668.
- Hanushek, Eric A., and Dennis D. Kimko (2000). "Schooling, Labor Force Quality, and the Growth of Nations," *American Economic Review*, 90(5): 1184-1208.

Heckman, James J. and Dimitry V. Masterov. (2007) "The Productivity Argument for Investing in Young Children." University of Chicago, Mimeo.

Jacoby, Hanan G. and Emmanuel Skoufias. (1997) "Risk, financial markets, and human capital in a developing country," *Review of Economic Studies* 64: 311-335.

Jacoby, Hanan G. and Emmanuel Skoufias. (1998) "Testing Theories of Consumption Behavior Using Information on Aggregate Shocks: Income Seasonality and Rainfall in Rural India," *American Journal of Agricultural Economics* 80:1-14.

James, Estelle. (1993) "Why Do Different Countries Choose a Different Public-Private Mix of Educational Services?" *Journal of Human Resources* 28(3):571-592.

James, Christopher, Kara Hanson, Barbara McPake, Dina Balabanova, David Gwatkin, Ian Hopwood, Christina Kirunga, Rudolph Knippenberg, Bruno Meessen, Saul S. Morris, Alexander Preker, Agnes Soucat, Yves Souteyrand, Abdelmajid Tibouti, Pascal Villeneuve and Ke Xuh. (2006) "To Retain Or Remove User Fees? Reflections on the current debate." *Applied Health Economics and Health Policy* 5 (3):137-153.

Jørgensen, Ole Hagen. (2006) Modelling the Cost of Education in Uganda. Mimeo, The World Bank.

Kattan, Raja B. (2006) Implementation of Free Basic Education Policy. *Education Working Paper Series #7*. World Bank.

Kim, J., H. Alderman and P.F. Orazem. (1999) "Can private school subsidies increase enrollment for the poor? The Quetta Urban Fellowship Program," *World Bank Economic Review* 13:443-465.

King, E. M., P. F. Orazem, and D. Wohlgemuth (1999) "Central mandates and local incentives: the Colombia education voucher program," *World Bank Economic Review* 13: 467-491.

Knowles, James C. and Jere R. Behrman. (2005). "Assessing the Economic Returns to Investing in Youth in Developing Countries." In C.B. Lloyd, J.R. Behrman, N.P. Stromquist and B. Cohen eds. *The Changing Transitions to Adulthood in Developing Countries: Selected Studies*. Washington, D.C.: National Academies Press.

Kremer, Michael, Sylvie Moulin and Robert Namunyu (2003), "Decentralization: A Cautionary Tale," Mimeo, Harvard University, April 2003.

Lavy, Victor. (1996) "School supply constraints and children's educational outcomes in rural Ghana." *Journal of Development Economics* 51:291-314.

Nishimura, Mikiko, Takashi Yamano and Yuichi Sasaoka. (2008) "Impacts of the universal primary education policy on educational attainment and private costs in rural Uganda." *International Journal of Educational Development* 28: 161-175.

Orazem, Peter F., Paul Glewwe and Harry Patrinos (2008) "The Benefits and Costs of Alternative Strategies to Improve Educational Outcomes" Report prepared for the Copenhagen Consensus.

Orazem, Peter F. and Elizabeth M. King (2008) "Schooling in Developing Countries: The Roles of Supply, Demand and Government Policy." in T.P. Schultz and John Strauss, eds. *Handbook of Development Economics, Vol. 4*.

Oxfam. (2001) Education Charges: A Tax on Human Development. *Oxfam Briefing Paper #3*.

Thomas, Duncan, Kathleen Beegle , Elizabeth Frankenberg , Bondan Sikoki , John Strauss and Graciela Teruel. (2004) "Education in a crisis," *Journal of Development Economics* 74: 53-85.

Tiongson, Erwin R. (2005) Education Policy Reforms. In A. Coudouel and S. Paternostro, eds. *Analyzing the Distributional Impact of Reforms*. World Bank.





### Copenhagen Consensus 2008

Each day, decisions are made about global political priorities. Unfortunately, political decisions seldom take into account a comprehensive view of the costs and benefits of implementing one solution and not the other or solving one problem instead of another.

In the Copenhagen Consensus 2008, an expert panel of eight outstanding economists, including 5 Nobel Laureates, delivered a ranked list of the most promising solutions to the ten of the most pressing challenges facing the world today: *Global Warming, Terrorism, Hunger and Malnutrition, Water and Sanitation, Air Pollution, Women and Development, Conflicts, Subsidies and Trade Barriers, Education and Diseases*. Around 55 of the world's leading economists and specialists in the ten challenges compiled up-to-date analysis of the best solutions to ensure the best possible foundation for the prioritization of the solutions.

### An overview of how to implement the top solutions from the Copenhagen Consensus 2008

Five best practice papers have now been written on the top-solutions on the economists' list from the Copenhagen Consensus 2008. These papers provide clear and focused empirical recommendations on the best practice and the costs and benefits of the solutions helpful for governments, international organizations, NGO's and philanthropists in both developed and developing countries.

The **Copenhagen Consensus Center** analyzes the world's greatest challenges and identifies cost efficient solutions to meeting these challenges. The Center works with multilateral organizations, governments and other entities concerned with mitigating the consequences of the challenges which the world is facing.

With the process of prioritization, the center aims to establish a framework in which solutions to problems are prioritized according to efficiency based upon economic and scientific analysis of distinct subjects.

The Copenhagen Consensus Center is headed by Bjørn Lomborg